We claim:

1. A method for minimizing critical dimension growth of a feature located on a wafer during an etch process including the steps of:

placing a wafer on a chuck in an etch reactor;

etching a wafer in an etch reactor; and

allowing the temperature of the wafer to climb to the range of about 130°C to about 300°C in order to minimize the critical dimension growth of the feature located on the wafer.

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2. The method of claim 1 wherein the allowing step includes reducing the transfer of heat from the wafer in order to increase the temperature of the wafer.

3. The method of claim 1 wherein the allowing step includes:

heating the chuck in order to increase the temperature of the wafer.

4. The method of claim 1 wherein the allowing step includes:

heating the chuck independently of the heating of the chuck caused by the etch process in order to heat the wafer.

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5. The method of claim 1 wherein the allowing step includes:

using a heating source to heat the chuck independent of the etch process in order to increase the temperature of the wafer.

6. The method of claim 1 wherein the allowing step includes:

adjusting the pressure of a gas contained in contact principally only with the backside of the wafer in order to increase the temperature of the wafer.

7. The method of claim 1 wherein the allowing step includes:

reducing the pressure of a gas contained principally only in contact with the backside of the wafer in order to decrease heat that is removed from the wafer and in order to increase the temperature of the wafer so that growth of the critical dimension is minimized.

8. The method of claim 1 wherein the allowing step includes:

using a heat source incorporated with the chuck to heat the wafer.

9. The method of claim 1 wherein the allowing step includes:

allowing the temperature of the wafer to rise to the range of about 130°C to about 300°C in the range of about 60 seconds to about 240 seconds.

10. A method for minimizing critical dimension growth of a feature located on a wafer during an etch process including the steps of:

placing a wafer on a chuck in an etch reactor;

controlling the temperature of the wafer by maintaining a gas in contact with a backside of the wafer;

etching a wafer in an etch reactor; and

allowing the temperature of the wafer to climb in order to minimize the critical dimension growth of the feature located on the

wafer by reducing the pressure of the gas in contact with the backside of the wafer.

11. The method of claim 10 wherein the allowing step includes: allowing the temperature of the wafer to rise to the range of about 130°C to about 300°C in the range of about sixty seconds to about 240 seconds by the reduction of the pressure of the gas.

12. The method of claim 1 wherein the allowing step includes: reducing the pressure of the gas before the etch process begins.

13. The method of claim 1 wherein the allowing step includes: allowing the temperature of the wafer to rise to the range of about 130°C to about 300°C.

14. The method of claim 10 including; etching a platinum feature on the wafer.

15. The method of claim 14 including: using chlorine gas to etch the platinum feature on the wafer.

16. The method of claim 10 including: using helium as the gas to control the temperature of the chuck

17. The method of claim 14 including: using helium as the gas to control the temperature of the chuck.

18. The method of claim 1 including; etching a platinum feature on the wafer.

19. The method of claim 18 including:

using chlorine gas to etch the platinum feature on the wafer.

20. A method for minimizing critical dimension growth of a feature located on a wafer during an etch process including the steps of:

placing a wafer in a reactor;

controlling the heat transfer with respect to the wafer in order to allow the temperature of the wafer to climb in order to minimize the critical dimension growth of the feature located on the wafer.

21. The method of claim 20 wherein:

said controlling step controls the temperature of the wafer by controlling the pressure of a gas maintained in contact with a backside of the wafer.

22. The method of claim 20 wherein:

said controlling step includes adjusting the degree of thermal insulation of the backside of the wafer.

23. The method of claim 6 wherein :

the adjusting step includes setting the pressure of the gas in the range of about zero torr to about 10 torr.

24. The method of claim 6 wherein:

the adjusting step includes setting the pressure of the gas at about 1 torr.

25. The method of claim 10 wherein:

controlling step includes setting the pressure of the gas in the range of about 0 torr to about 10 torr.

26. The method of claim 10 wherein:

said controlling step includes setting the pressure of the gas at about 1 torr.

27. The method of claim 1 wherein:

the placing step includes the wafer with features comprised of one of platinum (Pt), copper (Cu), iridium (Ir), iridium dioxide (IrO_2), ruthenium (Ru), ruthenium dioxide (RuO_2), lead zirconium titanate (PZT), barium strontium titanate (BST), and bismuth strontium tantalate (Y-1).

28. The method of claim 10 wherein:

the placing step includes the wafer with features comprised of one of platinum (Pt), copper (Cu), iridium (Ir), iridium dioxide (IrO_2), ruthenium (Ru), ruthenium dioxide (RuO_2), lead zirconium titanate (PZT), barium strontium titanate (BST), and bismuth strontium tantalate (Y-1).

29. The method of claim 20 wherein:

the placing step includes the wafer with features comprised of one of platinum (Pt), copper (Cu), iridium (Ir), iridium dioxide (IrO_2), ruthenium (Ru), ruthenium dioxide (RuO_2), lead zirconium titanate (PZT), barium strontium titanate (BST), and bismuth strontium tantalate (Y-1).

30. The method of claim 1 including:

the placing step includes the wafer with features comprised of platinum;

the etching step includes using chlorine gas as the etchant in a reactor with a pressure in the millitorr range; and

the allowing step includes using helium gas with a pressure in the range of about 0 torr to about 10 torr in order to control heat transfer from the chuck and the wafer.

31. The method of claim 10 including:

the placing step includes the wafer with features comprised of platinum;

the etching step includes using chlorine gas as the etchant in a reactor with a pressure in the millitorr range; and

the allowing step includes using helium gas with a pressure in the range of about 0 torr to about 10 torr in order to control heat transfer from the wafer.

32. The method of claim 20 including:

the placing step includes the wafer with features comprised of platinum;

etching the wafer using chlorine gas as the etchant in a reactor with a pressure in the millitorr range; and

the controlling step includes using helium gas with a pressure in the range of about 0 torr to about 10 torr in order to control heat transfer from the wafer.

33. The method of claim 1 wherein the allowing step includes:

allowing the wafer temperature to rise from about 225°C to about 250°C during the period of about 60 seconds to about 150 seconds from the beginning of etch in order to cause critical dimension growth to plateau.

34. The method of claim 33 wherein the etch process is carried out in a low pressure etch reactor which operates in the millitorr range and wherein a gas is contained in contact with the chuck, which gas is in the range of about 0 torr to about 10 torr and is preferably about 1 torr.

35. The method of claim 6 wherein the etch process is carried out in a low pressure etch reactor which operates in the millitorr range and wherein a gas is contained in contact with the chuck, which gas is in the range of about 0 torr to about 10 torr and is preferably about 1 torr.

36. The method of claim 10 wherein the allowing step includes:

allowing the wafer temperature to rise from about 225°C to about 250°C during the period of about 60 seconds to about 150 seconds from the beginning of etch in order to cause critical dimension growth to plateau.

37. The method of claim 36 wherein the etch process is carried out in a low pressure etch reactor which operates in the millitorr range and wherein a gas is contained in contact with the chuck, which gas is in the range of about 0 torr to about 10 torr and is preferably about 1 torr.

38. The method of claim 10 wherein the etch process is carried out in a low pressure etch reactor which operates in the millitorr range and wherein a gas is contained in contact with the chuck, which gas is in the range of about 0 torr to about 10 torr and is preferably about 1 torr.

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